

REMARKS AND RESPONSES

The Examiner is thanked for the thorough examination of the present application. The Office Action rejected all claims 10 and 21-25. In response, Applicants submit the foregoing amendments and the following remarks. After entry of the foregoing amendments, claims 10 and 21-25 remain pending in the application.

Claim Rejection - 35 U.S.C. §103

Claims 10 and 21-25 are rejected under 35 U.S.C. §103(a) as being unpatentable over Takahashi (U.S. Patent No. 5,343,104) in view of Murata (U.S. Patent Publication No. 20010036409).

All rejections have been rendered moot by the amendments made to the independent claims herein. Notwithstanding, Applicants submit the following additional distinguishing remarks. Applicants respectfully request reconsideration of the rejections for at least the reasons that follow.

All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

(Emphasis added, MPEP §2143.03 – “All Claim Limitations Must Be Considered”)

Of the rejected claims, only claims 10 and 23 are independent, and these claims recite:

10. A fan structure comprising a hub, a motor located inside the hub, a plurality of fan blades connected to the hub, and a circuit board connected to the motor, wherein the circuit board comprises a protrusion, extending outside the circumference of the hub, and the protrusion carries thereon a heat-generating component and comprises a cutout that extends from a tip of the protrusion to the heat-generating component.

23. A circuit board for operating a fan having a hub, the circuit board comprising:

a protrusion extending outside the circumference of the hub of the fan and carrying thereon a heat-generating component;

wherein the protrusion comprises a cutout that extends from a tip of the protrusion to the heat-generating component.

(Emphasis added) Claims 10 and 23 patently define over the cited art for at least the reason that the cited art fails to disclose at least the features emphasized above.

The Office Action admitted that Takahashi does not disclose the claimed heat-generating component. Instead, the Office Action cited Murata for teaching these claimed features. In this regard, the Office Action stated “Murata teaches that it is desirable to cool the electric components of a fan motor on an integrated circuit board (122). (Abstract)”. Applicants respectfully disagree. As confirmed by Abstract of Murata and the related specification text, Murata does not provide any relevant teaching about the structural connection between the heat-generating component and the protrusion. In fact, Murata discloses the heat-generating component should be disposed on the circuit board **within a circuit board enclosure**. This is confirmed throughout the specification. For example, paragraph [0056] of

Murata states:

The circuit unit 104 has a circuit board 122, **disposed in a circuit board enclosure 121** constructed of insulative material, for controlling electric power to the motor unit 102. The circuit board 122 is connected with a power supply wire 123 in connection to a power supply unit of the cleaner, and a signal wire 124 for transmitting an operating command signal from the cleaner. The enclosure 121 is so disposed as to locate in a space between the bracket 112 and the air guide 119 of the fan unit 103. There is a cooling air inflow port 125 located in a front lower area of the enclosure 121. There is a cooling air outflow port 126 located at a side of the bracket 112 in communication to an interior of the motor unit 102. The inflow port 125 and the outflow port 126 form an airflow path within the enclosure 121 for the exhaust air delivered by the fan unit 103. A triac defining a power device 127 for controlling electric power is mounted integrally with a small radiating fin 128 so as to locate in a part of the airflow path on the circuit board 122.

Therefore, Murata does not supply the requisite teaching that the Office Action cites it as teaching. That is, Murata fails to disclose the claimed feature: "the protrusion **carries thereon** a heat-generating component". For at least this reason, the rejection of claims 10 and 23 should be withdrawn.

In view of the foregoing remarks, it is respectfully submitted that the prior art utilized by the Office Action fails to teach or suggest the claimed heat-generating component of independent claims 10 and 23 and their dependent claims. Accordingly, reconsideration and withdrawal of the 35 U.S.C. § 103 rejections are respectfully requested.

In addition, Applicants further request reconsideration of the rejections

for at least the reasons that follow.

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)

(*Emphasis added*, MPEP §2143.01 **V. THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE**)

Because from the facts derived from Takahashi and Murata, as set forth below, the suggested combination or modification would render Takahashi inoperable for its intended purpose.

First, Takahashi discloses that the purpose of temperature detection is achieved by a chip thermistor. In order to assure that the result of the temperature detection is correct, Takahashi teaches that the chip thermistor must be mounted on the mounting portion, which extends outwards from the printed circuit board. That is, the mounting portion can separate the chip thermistor and the heat-generating component on the printed circuit board, and thus the heat-generating component will not interfere with the chip thermistor. This is confirmed throughout the specification. For example, col. 8, lines 31-55 states:

For the purpose of temperature detection, the printed circuit board 224 has, as its integral part, a mounting portion 228 which extends radially outward as shown in FIG. 15, and a chip thermistor 229 is directly connected to trace lands 230, 230 on the mounting portion 228. The mounting portion 228 is provided with a hole 231 to assure that the thermistor 229 is directly exposed to circulating air. This allows the thermistor 229 to accurately detect the temperature of the delivered air. Since the mounting portion 228 extends radially outward, the thermistor 229 on it is little affected by heat generated by

circuit components such as ICs and resistors on the printed circuit board 224. Thus, temperature detection error introduced by disturbing heat is minimal, and thus the thermistor 229 detects the temperature of the atmosphere as desired with sufficient accuracy. Furthermore, compared to a thermistor with leads which may need manual soldering to a printed circuit board, the chip thermistor 229 may be easily subjected to automated mounting along with other chip components on the printed circuit board 224.

FIG. 16 shows a variation of the printed circuit board 224. The mounting portion 228 of the printed circuit board 224 is provided with a U-shaped cutaway 232. The thermistor 229 is installed over the cutaway 232.

Accordingly, it is clear that the heat-generating component must not be mounted on the mounting portion. Otherwise, the heat generated by the heat-generating component would interfere with the result of the temperature detection.

However, the modification proposed in the Office Action is to provide the mounting portion of Takahashi with the heat-generating component of Murata. Therefore, it is obvious that the proposed modification would render Takahashi being modified unsatisfactory for its intended purpose (i.e. temperature detection). For at least this reason, the rejection of claims 10 and 21-25 should be withdrawn.

As a separate and independent basis for the patentability of all claims, Applicants submit that the combination of Takahashi and Murata is improper and therefore does not render the claims obvious. In this regard, the Office Action combined Takahashi with Murata to reject the claims on the solely expressed basis that "it would have been obvious to one of ordinary skill in the art at the time of the invention was made to have provided the protrusion area of Takahashi with an heat generating electronic component in view of the

teachings of Murata et al; in order to prevent overheating of the motor or its components.”

This rationale is both insufficient and improper in view of the established standards for rejections under 35 U.S.C. § 103.

In this regard, the MPEP section 2141 states:

The Supreme Court in KSR reaffirmed the familiar framework for determining obviousness as set forth in *Graham v. John Deere Co.* (383 U.S. 1, 148 USPQ 459 (1966))... As reiterated by the Supreme Court in KSR, the framework for the objective analysis for determining obviousness under 35 U.S.C. 103 is stated in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966). Obviousness is a question of law based on underlying factual inquiries. The factual inquiries enunciated by the Court are as follows:

- (A) Ascertaining the differences between the claimed invention and the prior art; and
- (B) Ascertaining the differences between the claimed invention and the prior art; and
- (C) Resolving the level of ordinary skill in the pertinent art.

In addition:

When applying 35 U.S.C. 103, the following tenets of patent law must be adhered to:

- (A) The claimed invention must be considered as a whole;
- (B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;
- (C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention and
- (D) Reasonable expectation of success is the standard with which obviousness is determined.

Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

As reflected above, the foregoing approach to obviousness

determinations was recently confirmed by the United States Supreme Court decision in *KSR INTERNATIONAL CO. V. TELEFLEX INC. ET AL.* 550 U.S. 1, 82 USPQ2d 1385, 1395-97 (2007), where the Court stated:

In *Graham v. John Deere Co. of Kansas City*, 383 U. S. 1 (1966), the Court set out a framework for applying the statutory language of §103, language itself based on the logic of the earlier decision in *Hotchkiss v. Greenwood*, 11 How. 248 (1851), and its progeny. See 383 U. S., at 15–17. The analysis is objective:

“Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.” *Id.*, at 17–18.

Indeed, as now expressly embodied in MPEP 2143,

“[t]he key to supporting any rejection under 35 U.S.C. 103 is the **clear articulation of the reason(s)** why the claimed invention would have been obvious. The Supreme Court in *KSR* noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit.”

(Emphasis added, MPEP 2143)

In addition:

“Objective evidence relevant to the issue of obviousness **must** be evaluated by Office personnel.”

“The key to supporting any rejection under 35 U.S.C. 103 is the **clear articulation of the reason(s)** why the claimed invention would have been obvious. The Supreme Court in *KSR* noted that the analysis supporting a rejection under 35 U.S.C. 103 **should be made explicit**. The Court quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), stated that ‘[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated

reasoning with some rational underpinning to support the legal conclusion of obviousness.”

(*Emphasis added*, MPEP 2141)

Simply stated, the Office Action has failed to at least (1) ascertain the differences between prior art and the claims in issue; and (2) resolve the level of ordinary skill in the art. As reflected above, the rationale for making the combination is: “in order to prevent overheating of the motor or its components.” This rationale for combining the references is merely an improper conclusory statement that embodies clear and improper hindsight rationale. That is, the rationale merely recites a perceived benefit that would result from the combination, but does not identify objective teachings that would motivate the combination. For at least these additional reasons, Applicants submit that the rejections of all claims are improper and should be withdrawn.

Conclusions

For all of the above reasons, applicants submit that the specification and claims are now in proper form, and that the claims define patentably over the prior art. Therefore applicants respectfully request that the pending claims be allowed at the Office Action’s earliest convenience.

Respectfully submitted,

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